The Northwestern MILLER

MILLING PRODUCTION SECTION

Novel Features in Sifter Construction

"After the roller mill . . . the sifter . . . is the machine that has the most influence on the performance of a mill. Today it cannot be replaced by any other type of machine."

By Paul Eppenberger

AFTER the roller mill, which does the grinding work in the mill, the sifter which separates the ground products is the machine that has most influence on the performance of a mill. Today it cannot be replaced by any other type of machine.

At a very early date millers had found that it is not possible to separate coarse and fine with one sieve. With the ordinary round hand sieve, it was possible, with a suitable movement to prevent fine light particles of a ground product from falling through the meshes, but rather to separate them out with the coarse particles. This work was consequently not an actual sieving, i.e. a separation of coarse and fine particles, but really a sifting.

EDITOR'S NOTE: Mr. Eppenberger is an engineer associated with Buhler Brothers, milling engineers of Uzwil, Switzerland.

In the later development of flour milling, especially when the automatic production of flour had made great progress, sifting became one of the principal problems.

In a sifter a number of separate sieves are arranged in sieve sets in each of several compartments, and held above each other in such way that (1) sieves with different mesh are provided as desired; (2) the incoming product can run over several sieves; (3) the tailings and throughs can be classified as required into further separations on the following sieves, or removed altogether. For this purpose collecting trays are arranged under the sieves, and in them the throughs are collected and guided in channels. In the same way the tailings are guided further in channels. A flow scheme of the product is therefore necessary for each sieve compartment.

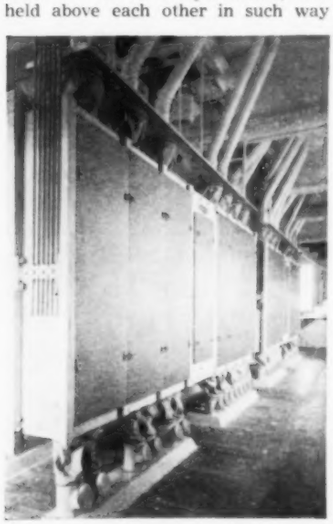

Figure 1

Sifters may be divided into two main groups according to their construction: frame sifters and box sifters. In the case of frame sifters, single frames with fixed or inserted sieves with suitable flow paddles are arranged over each other on a horizontal central steel frame at both sides of the drive, in such a way that they are connected with clamping screws to the middle main frame structure. In this way positive tightness of the sieves and channels is obtained.

The drawbacks found in service are: inaccessibility of the individual sieves when cleaning or when changing the sieves; it was necessary to dismantle completely the sieve nests; large space required when dismantling; difficult to determine and change the flow scheme.

The box sifter is so-called because the sieve compartments are built into boxes, located at both sides of the drive. These boxes are carried by supporting bars, central frame structure, just as in the case of frame sifters, or are built onto vertical central frames. In the box itself a distinction is made between drawer sieves and stacking sieves.

In the case of box drawer sifters, the sieves themselves are inserted each into removable drawer with bottom trays, in which case delivery, throughs and tailings are connected to outside channels by suitably necessary openings according to a definite scheme.

The drawers themselves can be pulled out after removing a cover. In the case of stacking sieves the separate frames containing the sieves are pressed together just as in the case of frame sifters. When the pressing means are loosened, the separate frames rest on guides, so that each separate frame can be drawn out as desired. The flow channels are built partly into the frames and partly outside and are sealed against the outside by covers. In Europe the number of sieves in a sieve set may amount to 6 to 18, but in the U.S. there are as many as 27 sieves in a sieve set.

Further Feature

A further outstanding feature of the sifter, which gives it its name, is the horizontally rotating movement. The speed of this rotation varies today very much from one design to another, for instance from 180 to 450 r.p.m., while the circle of the rotating movement varies from 1¼ to 4".

In most designs of sifters the sieves are absolutely horizontal. But here also exceptions are to be found, the sieves from inlet end to the scalp end being given an inclination of two degrees. The sieve dimensions are also quite different. For the same area there are round, square, hexagonal and rectangular sieves with a ratio of length to width of as much as 4:1. It might be mentioned that even spiral sieves have been tried, in the hope of getting better capacity.

Not only have the sieves changed but also the cleaning methods for keeping the meshes open have been designed and tested in countless variations.

At the beginning, a cleaning material such as coarse grains was for many years the only method of keeping the sieves clean. Then brushes were used in many designs for cleaning the sieves from below. Hitherto, circulating and rotating brushes have proved to be the best, but without being fully satisfactory in every case. In the U.S. the cleaner generally used is cotton cleaners. But also cleaning with rubber balls shows good results within certain limits.

The difference in the cloth of sieves is also very great, quite apart from the fineness of the number of meshes per square inch. Without speaking of the old bolting cloth, silk gauze has hitherto been the most widely adopted. There are also to be found tinned steel wire screens, bronze gauze and lately wire cloth made of stainless steel. For some years nylon cloth, pure or woven with silk, has also given good results.

While the roll passage has always to handle only one certain product, the following sieve passage separates the product according to different granulations and qualities. Each sieve passage, which is identical with one set of sieves of the sifter, has therefore a flow scheme, i.e. the scheme shows how the several tailings or throughs of each separate sieve are guided through the set of sieves.

In the case of a given sieve cloth, however, the travel of the stock depends on the performance of the individual sieve. The cover itself is determined by the kind of stock and the desired sifting and classifications, according to the diagram of the automatic mill.

Starting Point

The starting point for designing a sifter is therefore the individual sieve.

The maximum capacity of a sieve depends on the kind of stock, the sifting height above the cloth, the cover itself, the sieve dimensions and the sieve cleaning, and all these factors change with variations in the speed of rotation and in the eccentric travel of the sieve. For instance, if sifting work is required, the layer

(Turn to SIFTERS, page 15a)

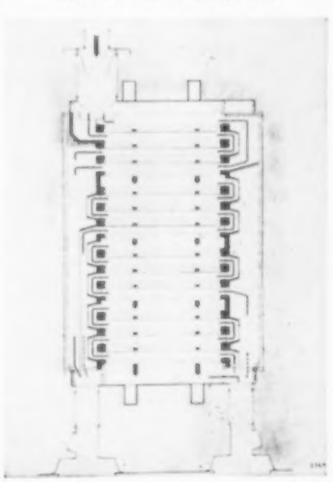

Figure 2

THE SCIENTIFIC APPROACH

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Observations While Visiting Mills Around World

An Account of a 35,000-Mile Tour Made by G. Highley Sugden, Henry Simon, Ltd.

EDITOR'S NOTE: G. Highley Sugden, joint managing director of Henry Simon, Ltd., British milling engineering firm, recently returned from a tour of some 35,000 miles around the world. Although his journey was primarily concerned with the milling industry and the service which the Simon organization overseas can render it, Mr. Sugden was able to spend a little time studying other aspects of the countries he visited. He returned with glowing reports of the great kindness and hospitality he received from members of the milling fraternity wherever he went, but in giving his impressions he commented: "I met several hundred people in my nine-week trip, and I cannot mention all who are known to millers here. So if I pick out a few, I hope you'll keep me out of trouble with the many others." This account of Mr. Sugden's journey originally appeared in Milling, the British milling trade journal.

MR. SUGDEN'S first stop was at the Ogilvie Flour Mills Co., Ltd., in Montreal, where he met John Willis, formerly with Spillers, Ltd., and T. Chris Mills, who some years ago was representative for Simon in Holland and later in Canada.

After a short stay in Toronto, where he met most of the senior people in the Maple Leaf Milling Co., Ltd., organization, Mr. Sugden visited Maple Leaf's Port Colborne, Ont., mill, at which Simon has recently carried out extensive alterations. At this plant discussions were held with technical staff of the Maple Leaf, headed by its general superintendent, Stuart Butler, under whom Alan Duckworth is in charge of the Port Colborne reconstruction.

United States

From Canada, Mr. Sugden, accompanied by Eric A. Stanger, Simon-Carter Co., Minneapolis, director in charge of Simon staff in North America, crossed over the Peace Bridge to Buffalo and then on to Minneapolis, where contacts were renewed with many of the top men in the American milling industry. Here also they attended a sales conference of the recently formed Simon-Carter Co. At this conference, Mr. Sugden had talks with Charles C. Ingraham, president of the company; Howard Mayhew, one of the originators of the disc separator and a very old friend of Simon, as well as many other members of Simon's American and British staff.

"After a hectic 10 days in North America," Mr. Sugden commented, "it was quite a relief to get in a plane and relax for nearly two days." His route took him to Australia via San Francisco, Honolulu and Fiji; at Honolulu all the ladies are welcomed with garlands of flowers, so the airport looked "a gay place even in the middle of the night."

Australia

"Landing at Sydney, one is immediately struck by the blend of the New World and the Old. There is much which reminds one of America—the modern one-story homes and fine office buildings, the wide highways with their mass of fast-moving motor cars, the obvious energy and optimism of a growing country," Mr. Sugden observed. "But there is much, too, like England—many of the older, somewhat Victorian buildings, the beautiful gardens where roses will bloom all the year round, the remarkable loyalty to the British crown and 'home.' It is unfortunate that the press in England sometimes includes damaging reports about life in Australia from people who have returned to this country. Naturally many things are different from what we have been accustomed to in England but if you concentrate on the good things, Australia has a great deal to offer, not the least the marvelous climate and abundant opportunities for all."

Mr. Sugden pointed out that life in some parts of Australia may have its rougher side, but nothing would shake his enthusiasm for the many new friends he had met nor his admiration for the ingenuity with which Australians have learned to overcome their problems. He mentioned the Holden car, now an almost entirely Australian product; many locally-made engineering products; the gigantic Harbor Bridge in Sydney; the Snowy Mountains hydro-electric power scheme; the great influx of "New Australians" from European countries; to name but a few.

While in Sydney, Mr. Sugden spent a good deal of time planning the future organization of Henry Simon (Australia), Ltd., with the chairman, K. R. Brocklehurst, and his colleagues.

Time permitted visits to only three of the largest cities and a number of country districts. But Mr. Sugden managed to meet nearly all the millers in the Sydney, Melbourne and Adelaide areas, many of whom are great travelers and therefore well known to millers in Britain and other European countries as well as in North America.

Australia millers are facing many difficulties due to loss of a large part of their former export markets, and many mills are running short time, even down to one shift only in some cases. "Simon and other leading milling engineers are sometimes blamed for this," said Mr. Sugden, "but most millers I talked to agreed that it was natural for developing countries to want to produce their own food and that if we did not build the new mills they needed somebody else would." Except in South Australia, where more stable conditions prevail, there is consequently much talk of rationalization in the Australian milling industry and some development of this sort certainly seems to be needed.

Mr. Sugden also had an opportunity of seeing some of the wheat growing areas of South Australia and Victoria. He visited a number of silos built by Simon in recent years for the more efficient handling and storage of wheat in country districts and also at the ports—his company is currently building a further four silos for the South Australian Bulk Handling Co. This is gradually leading to better grading of wheat, at least between hard and soft varieties, a trend which would be widely welcomed by millers in this country, Mr. Sugden said. The best wheats for baking quality with up to 17% of protein are grown in Queensland and fetch high premiums.

In Australia, and in New Zealand, too, Mr. Sugden was most impressed by methods used to develop sparse grassland or bush country into first class grazing areas. Trees and scrub are burned and later bulldozed off, then trace elements are sprayed—usually from the air; as little as one ounce per acre of the lacking element is frequently enough to turn useless land into excellent sheep country.

New Zealand

"If I am enthusiastic about the possibilities for the future development of Australia, I am at least equally impressed by the beauty of New Zealand," Mr. Sugden said of his visit here. "People say it's like England and Switzerland combined, and certainly there's much to remind one of both countries. It's the variety which is so fascinating, mountains and waterfalls and lakes, rolling green fields and winding roads and beautiful gardens, and some of the towns, particularly Christchurch, are so like England."

Mr. Sugden was driven right across the North Island from Auckland to Wellington by friends from the Northern Roller Milling Co., which is among the biggest milling firms in New Zealand. Guide-in-chief was John King, general manager of the company, who proved to be an expert on the vast volcanic fault which runs right across the North Island with its volcanoes (active and extinct), earthquakes, geysers and steam clouds, boiling "like huge poached eggs," and hot streams, capable of cooking some of the enormous trout in the area, Mr. Sugden said. They visited the "thermal wonders" at Rotorua and Wairaki with its Maori village and "hot and cold" laid on, put their fingers in cold streams and burned the tips of them when they thrust them an inch or two down into the sand of the stream beds, saw the huge power station still under construction which is already being operated entirely by natural steam.

"The noise and clouds of steam blowing off through great funnels all around are terrific, all coming up from 4,000 ft. below the earth's surface."

Mr. Sugden also had an opportunity of driving into the mountains of the South Island with Geoffrey Wood of Christchurch to see some of the country. With Mr. King and Sandy McNab, technical supervisor, a visit was paid to the new N.R.M. mill at Mount Maunganui, a plant of 21 (200 lb.) sacks capacity which has just been officially opened.

The New Zealand milling industry is operating on a pre-war system of government control which permits mills to run about 10 hours a day. "Price controls and other regulations seem to be the cause of much frustration in New Zealand, and it is generally felt that a relaxation of government controls and a return to private enterprise would be welcomed by the millers. However, balance of payments problems, and greater difficulty in finding markets for their meat and butter may in time lead to the same answers we have had to adopt here (England)—removal of controls, freer competition and re-learning how to sell one's products against all comers. In the long run I have no fears about the future of New Zealand, for any land which can produce such magnificent soldiers will eventually free itself from frustration in the economic field," Mr. Sugden said.

"The milling industry, however, has another problem. About two thirds of the population is now in the North Island, while most of the milling capacity is in the South Island, and the cost of handling and shipping flour across to destinations in the North Island is naturally high. Moreover, due to balance of payments difficulties, the wheat acreage has this year been doubled; this is mostly grown in the South Island, but there are practically no facilities for drying and handling home-grown wheat in bulk, again involving unnecessarily high costs in getting the finished product to the consumer. Unfortunately, the present control system leaves millers with little or no margin for putting these matters right."

Philippines

Mr. Sugden traveled up from Sydney by way of Darwin with James Sherwood, sales manager of Henry Simon (Australia), Ltd., for their second visit to the Philippines in recent months. They stayed in the Manila Hotel, which was Gen. Douglas MacArthur's headquarters during the early stages of World War II and subsequently the headquarters of the occupying Japanese. Manila was badly bombed by both sides and there was much suffering from starvation, but the Filipinos have recovered well and are cheerful people, proud of their Spanish ancestry and now of their new independence. Amongst many other impressions, Mr. Sugden commented on the "Jeepnies," gaily colored Jeeps run under private ownership which make up the main public transport system of Manila.

Apart from renewing many old friendships, discussions were held with the Wellington Investment and Manufacturing Corp. to finalize details for the complete new 7,000 bag (52 sacks/hour) mill, which Simon is building for this concern near Manila. This will be among the most modern plants in this part of the world and will include a pneumatic discharging plant, 15,000 ton silo, pneumatic wheat cleaning and mill, with a single story warehouse arranged for economic handling of products.

Hong Kong

From the Philippines, Mr. Sugden traveled to Hong Kong where he received a welcome from his friends in the Sung family. Mr. Sugden paid a visit to the family's Hong Kong Flour Mills accompanied by David Sung, whose father was formerly owner of a big group of mills in Shanghai; P. P. Sung, technical director, and Tom Schofield, manager and a former member of the Simon staff.

Time was also taken to show Mr. Sugden around Hong Kong island, with its towering rocky cliffs surrounded in every direction by a sparkling blue sea. Many years ago a senior officer was sent by the British Admiralty to purchase a certain island for the formation of a new naval base. Map reading, or perhaps the maps themselves, were not very good in those days and the senior

officer finished by buying the wrong island, but it is now generally agreed that Hong Kong was a lucky mistake.

Mr. Sugden reported it to be a most bustling community, with huge new buildings going up on every inch of available space like an American or Canadian city. Where there is no space, rock is hacked away, mainly by hand, tipped into the sea and the result is space for two new buildings instead of one. This land reclamation is going on the whole time and has enabled the huge Kai Tak airstrip to be built right out into the sea at Kowloon making landing in bad weather a much less hazardous operation. Kowloon, a mile across the harbor wherein Chinese junks and modern navies are all busy with their own affairs, is also going ahead by leaps and bounds in spite of being situated in the New Territories, which are on lease from China only for another 37 years. However no one seems to worry about that. The country districts of the New Territories are also fascinating with ancient methods of agriculture and even planting individual seeds by hand, all mixed up with Jockey or Golf Clubs and Army camps.

Hong Kong is reputedly the finest shopping center of the world, where every nation (including Communist countries) competes on a completely duty-free basis. The most magnificent silks, embroideries, carvings and every modern article like cameras and watches can be bought cheaper than anywhere else in the world.

"The Chinese shops with their queer vertical signs, their fascinating contents, like pressed duck or carved ivory, and the Chinese restaurants with their incredible variety of wonderful dishes like sharks fins, bamboo shoots and birds-nests are something out of this world. And I'm getting to be pretty good with chopsticks, too!" Mr. Sugden remarked.

Conclusion

Home in 40 hours by air via Singapore, Colombo, Bombay, Bahrein, Beirut, across Cyprus and Rome, Mr. Sugden gave the main impressions from his long tour.

"I think they are three," he said. "Firstly, the great friendliness and kindness of millers I have met everywhere; they, like so many members of our own staff, could not possibly have done more to make my visit instructive, useful and enjoyable. Secondly, the wisdom of our ancestors; there can be few finer positions in the world for modern cities and harbors than San Francisco, Sydney, Auckland, Wellington and Hong Kong—each one of them is absolutely beautiful with hilly promontories surrounded by blue water glittering in the sunshine. Thirdly, all of these countries and perhaps particularly Canada, Australia and New Zealand are lands of opportunity, lands which are calling to people who have the spirit of adventure in their veins like the courageous mariners of former times who founded them. What a pity I'm getting old!"

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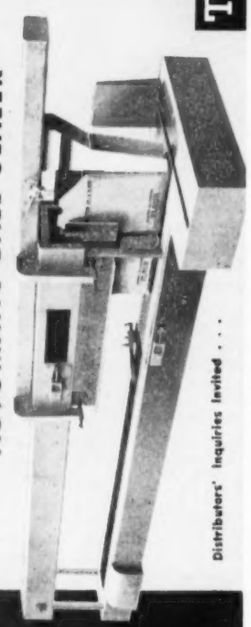

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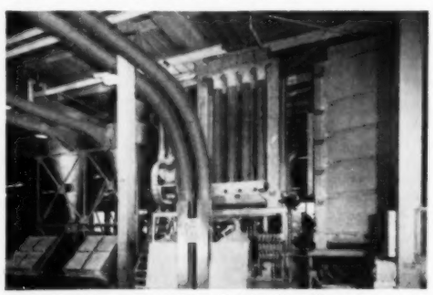

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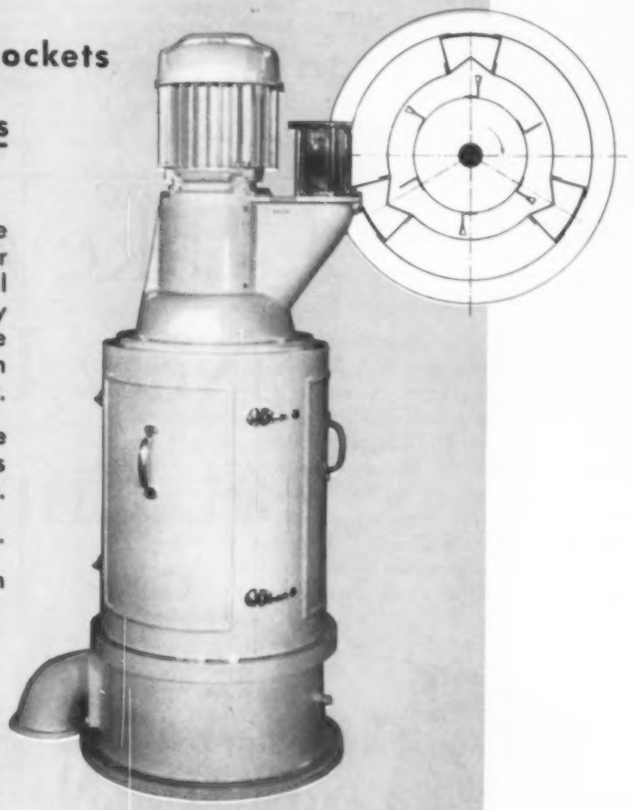


Increased amount of flour with low ash contents

Large clean bran flakes

The bran enters from above into the processing space enclosed by sieves in which the dynamically balanced rotor fitted with beaters revolves at high speed. The bran is well distributed by means of the beaters and constantly cushioned and turned by the vertical impact pockets so the particles of flour are thoroughly removed from the bran flakes because of the beater and impact pocket effect.

The flour leaves the machine through the perforations of the sieve cover and is discharged through a hopper, whereas the bran particles leave the machine through a spout.

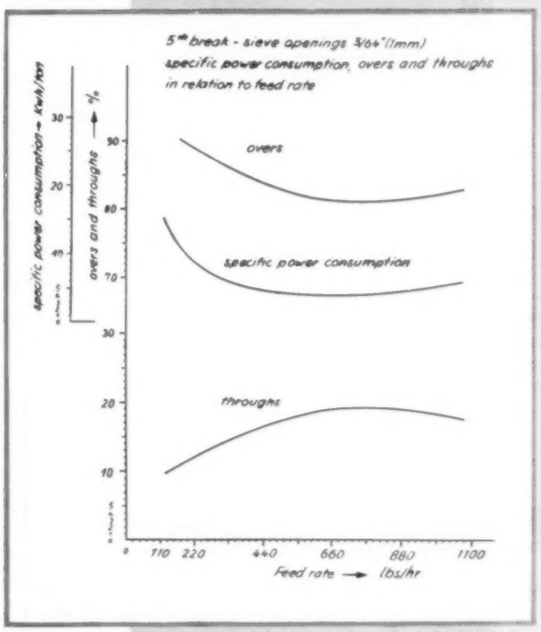
The machine is driven by a flanged motor* on top.

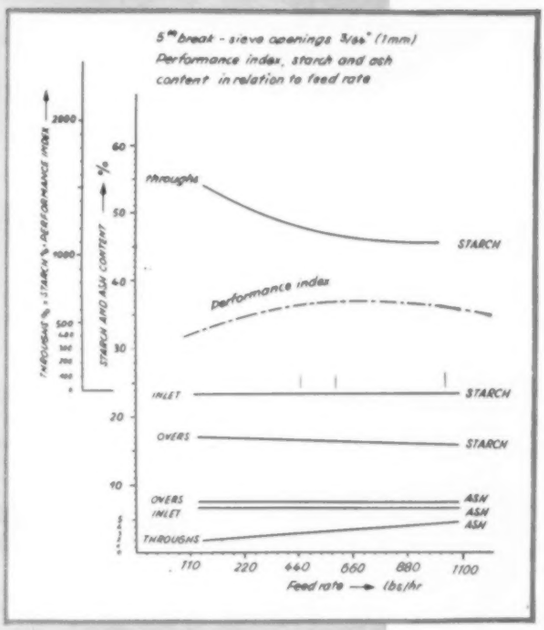
The dynamically balanced rotor ensures a smooth run of the machine.

The bran finisher is installed in wheat flour mills usually after the 4th to 6th break, in rye mills after the 1st break as well as the 5th and 6th break.

3 sizes for capacities from 250 to 3000 lbs/hour.

* motor with Underwriter's label for Class 2 group G application available.


5th break - sieve openings 3/64" (1mm)
specific power consumption, overs and throughs in relation to feed rate
specific power consumption — kwh/ton
overs and throughs — %
overs
specific power consumption
throughs
Feed rate → lbs/hr



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Experiences While Visiting Far Eastern Countries

By E. Walter Morrison

WE traveled entirely by air, routed with stopovers at Seattle, Washington, one day, two nights; Anchorage, Alaska, one afternoon, one night; Tokyo, Japan, eight days; Hong Kong, five days; Bangkok, Thailand, five days; Singapore, Malaya, five days; Manila, Philippines, four days; Honolulu, Hawaii, two days; Los Angeles, two days, and home. Between points named, we had fuel stops at Shemya, Aleutian Islands; Okinawa; Saigon, Viet Nam; Guam and Wake Islands.

We experienced the unusual, for us, of leaving Anchorage, Alaska, at 2:50 a.m. Saturday, Nov. 8, and arriving in Tokyo 2:08 p.m. the same day; yet, it was Sunday, Nov. 9. Returning, we left the island of Wake in the late evening of Saturday, Dec. 6, and arrived in Honolulu, Hawaii, before daylight Saturday, Dec. 6, arriving 12 hours before we departed.

Adjustment Difficult

Our subconscious minds refused to adjust to such rapid time changes. Often we found ourselves overwhelmed by sleep in daylight hours, and wide awake at night. For years I have never required an alarm clock. If an early plane was to be caught, my subconscious awakened me within five minutes of required moment; but my subconscious never learned that the hour of awakening was not to be measured from the hour of retiring. Sometimes on this trip it wakened me before I went to bed.

Our travel was arranged by a travel agent. We purchased in advance personally conducted travel. We were met at the airports by a private car with driver-guide, driven to our hotels where accommodations awaited, and returned to the airport in the same manner when departing. Our sightseeing within metropolitan areas was done in the same way.

EDITOR'S NOTE: Mr. Morrison is president of the Morrison Milling Co., Denton, Texas. He and Mrs. Morrison recently visited a number of cities in Asia. This is an account of their trip.

We attended church every Sunday. Being Baptist, we attended Baptist churches, where the services were in English. We did not visit a country where we did not meet with people who had once lived in Denton. Some we had previously known; others knew well our Denton friends. Because of Denton's two colleges, Dentonites travel far and worldwide and extend a hearty welcome to other Dentonites who happen to pass. Our trip's most enjoyable moments resulted from such meetings.

We visited American consulates, embassies, and importers in various countries when opportunities were found.

We found Seattle a most interesting city, and the snow-covered mountains near Anchorage beautiful. We drove 35 miles toward Seward and took color pictures of the mountains and roads covered with snow, recording such beautiful scenery.

Visit to Japan

In Japan we visited the cities of Tokyo, Yokohama, Nagoya and Kyoto. We traveled by train between cities; we were entertained in the homes of Tokyo residents; we visited a new Buhler mill owned by the gentleman whose daughter will marry

E. Walter Morrison

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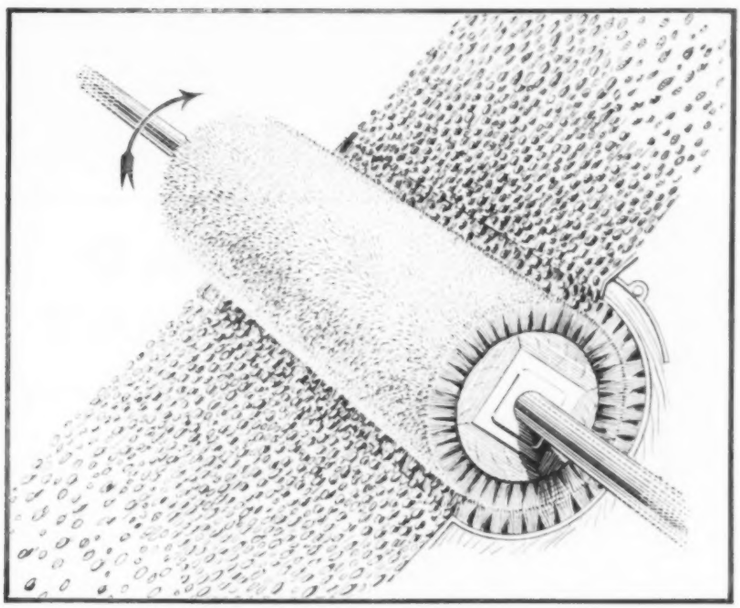
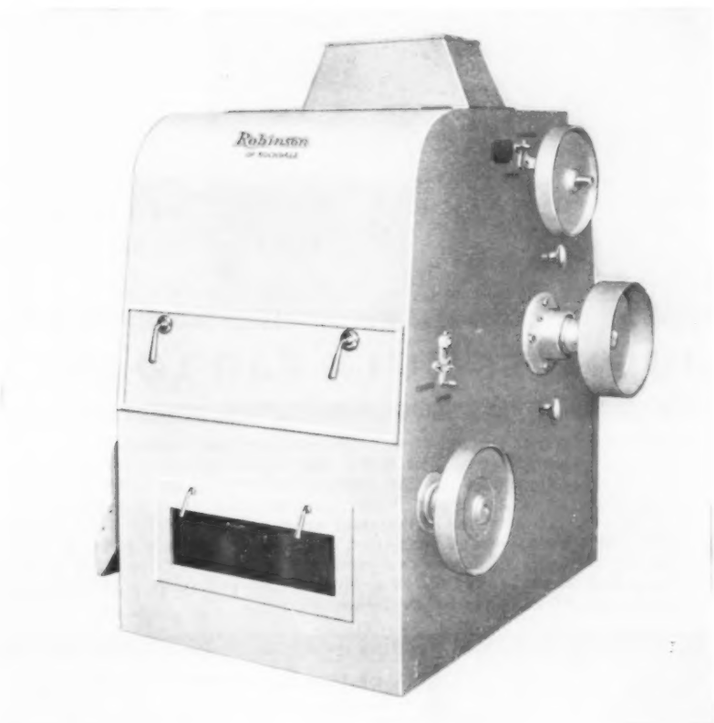


Searching cleaning effect of exclusive "brush-to-brush" action

Grain is fed in a thin, even stream (as it would be into the nip of a first break roll) between a stoutly-bristled rotating brush and a stationary brush. The stationary brush is made up of evenly adjustable segments, and wraps round the revolving brush. The result is a most searching and thorough treatment of each individual grain between the bristles, which loosen and remove beeswing, dust and dirt, and ensure that the cleanest possible wheat is fed to the First Break rolls. It is this highly efficient process which has resulted in the improved quality of resultant flours where the Lord Brush is installed.

THE Robinson LORD BRUSH



- Long life of brushes
- Powerful aspiration on feed and delivery
- Large capacity
- Compact—little floor space required
- Unique method of adjusting stationary brush to wrap round rotating brush
- Automatically balanced feed and delivery gates

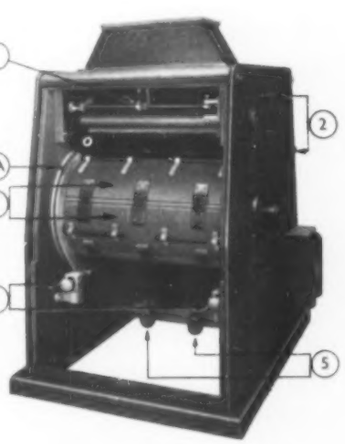
(1) Swinging feed plate adjustable to flow of stock. May also be fixed.

(2) Two powerful aspirations controlled from here.

(3) Adjustable segments of outer brush (two visible). Note calibrated scale. (A)

(4) Two main controls easily reached and adjusted while machine is in motion.

(5) Preloaded delivery gate ensures full-width, even delivery.



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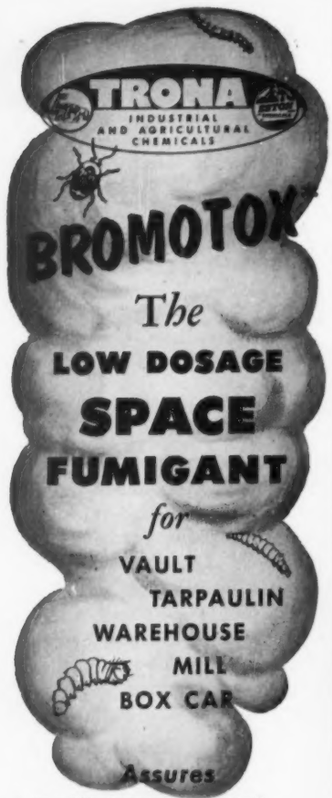
the Japanese Emperor's son. We became great admirers of the Japanese people contacted. We found them bright, intelligent, courteous, kindly, happy, thrifty, hard-working people, with whom we found it a pleasure to associate. Japan is a beautiful country, and I believe the Japanese race will again rise to be one of the world's prominent nations—I believe deservedly so. The Japanese are willing to pay the price of success in hard, dependable work.

We visited the British colony cities of Hong Kong, Kowloon, and the New Countries controlled by Hong Kong government under lease from China. Hong Kong is a free port. The colony produces little, if any, raw materials, and does little, if any, heavy manufacturing. Hong Kong and Kowloon are merchant cities. Its merchants buy and sell anything the world makes, and perform their service at great buyer savings. The population is dense. The cities of Hong Kong and Kowloon house 2¾ million people.

The contrast between untold riches and the most abject poverty is everywhere prevalent and evident. The rich live in palaces on the heights of Mt. Victoria amidst luxurious surroundings. The poor live anywhere they can find shelter—in sampans (houseboats of the crudest character) whereon small cabins are built from any material available—scrap sheet metal, ruberoid roofing, canvas sails, bamboo poles, or whatever is found without cost. Such residents are called Hong Kong's floating population, and their boats are often anchored so closely one can literally walk from one side of the waterway to the other from boat to boat. The smells are terrific. The lack of sanitation appals.

Other poor live on the roof tops, on the sidewalks, in surroundings of utmost squalor. They sleep on boards, store their water in earthen jars, carry water for blocks from the nearest hydrant. The hydrants flow only a few hours daily. When water flows,



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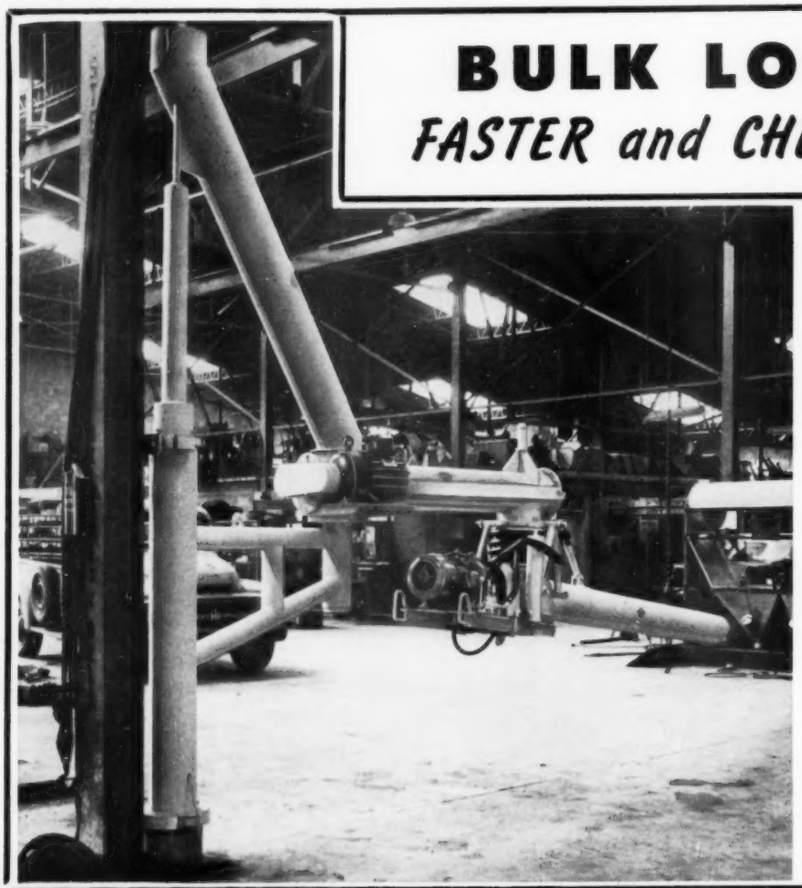

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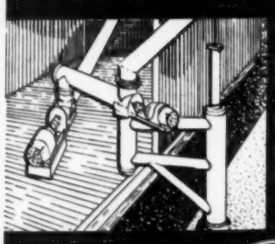

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people are crowded near the hydrant —some bathing, others scrubbing teeth, bathing children, or washing clothes. Water is precious.

Conditions Poor

The Hong Kong government has done much slum clearing, but has bettered conditions little. Newly built apartment buildings, five, six, or seven stories high, having open-air galleries projecting on each side, have inside rooms, fifty or more to the floor, with only one bathroom to each floor, and 20 or more people living in one room, 20 ft. square. Sanitary facilities provided are inadequate. How people can so live one wonders; yet, they do.

Beggars are everywhere. When our car stopped, we were immediately surrounded by a group of children, ages 3 to 15 years or older, all with outstretched hands—begging money. Often a little girl or boy no more than 6 or 7 years old would have a baby strapped to his back while begging money to help pay for family living. A total of 5.80 Hong Kong dollars equal one dollar American, and are divided into ten-cent pieces. How those poor children would scramble for a dime Hong Kong!—1.6¢ American.

Hong Kong tailoring is excellent. Woolens are of choice English or Scotch manufacture. Clothing prices are about one-third of prices in the U.S.; but in Hong Kong, one gets custom tailored fittings, and price comparison is made with American hand-me-downs.

Common labor in Hong Kong flour mills is paid $1 Hong Kong per hour —$.1724 American.

The Hong Kong Flour Mill is a Simon mill. P. P. Sung, its technical director, said that it had operated for four straight years without a shutdown longer than 16 hr. monthly for lubrication and machine adjustment. Wheat ground is bought from Canada, Australia and the U.S. The U.S. supplies the smaller portion. Sixty per cent of the mill's production is sold in the British colony of Hong Kong; the remaining 40% is exported. Little sales effort is required.

This mill appears to have a near monopoly of Hong Kong business, although considerable flour is yet imported into the colony. The mill was a picture of cleanliness. I never see one of these newer pneumatic mills in operation without becoming more convinced that mills of the bucket elevator, screw conveyor type are obsolete; that all such mills must yield sooner than we now think to the pneumatic type, and that when a few mills so perfectly free from dust accumulations begin operating in the U.S., FDA pressure upon other mills to convert to the pneumatic type will become irresistible.

Picture Book Travel

To visit Bangkok, Thailand, was like traveling through a picture book. One must see my color slide pictures to believe our stories about the picturesque temples, with gorgeous interiors, and the contrasting conditions under which the people live. We took 504 color slides; most very good, some excellent.

Bangkok sits in the delta of the large River Chao Phyrayo. The ground is level so far as the eye reaches, and is not more than three or four feet above sea level at high tide. The plain is cut in ribbons of islands, peninsulas, etc., by the many arms of the big river's delta, which finds its entrance to the sea within 20 miles of Bangkok. Between the arms of the delta flow canals, or klungs, and upon all water a foot or more deep at low tide there is boat traffic. Along the banks appear warehouses, so-called supermarkets, restaurants, bakeries, rice mills, hide, rice and hemp warehouses. Every need of mankind is available for water transport almost anywhere. One can travel for miles along the klungs.

Our hotel accommodations were excellent at the Erawan. Mosquitoes were most plentiful everywhere. Water buffalo, the beasts of burden, are also used for milk, beef and hides. Rice is the principal grain crop. Vegetables and fruits of all kinds, many exotic varieties which we had never before eaten, are plentiful and cheap.

Thailand declared war against the U.S. in World War II, but, nevertheless, has erected a victory monument on Bangkok's principal street. When you mention to a Thai that he was once our enemy, he will always say that the Thai people were misguided by their rulers, and they now regard we Americans as their greatest friends. They may think otherwise when foreign aid ceases.

We visited the embassy in Bangkok carrying letters of introduction to embassy officials. We met in Bangkok a delegation of wheat growers, representatives of the Pacific Wheat Growers Assn., the Nebraska Wheat Growers Assn., and Jack W. Wells, of the Millers National Federation in Washington, who were visiting South Asiatic countries trying to develop greater use of wheat and wheat products. Among embassy officials appeared great concern regarding possible disposition of the "Ticals" accumulated and unspent resulting from America's barter transactions.

We visited Singapore solely because

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it is the farthest point to which we might fly round trip from the U.S. without increasing our cost of air travel. Singapore is also a British colony—a free port strategically situated as a naval base, and at the crossroads of the world's ocean travel and trade. Singapore is an interesting island city. We were met by George E. Graham, the son of our fire insurance agent. George spared neither time, effort, nor expense to show us the sights and to see that we enjoyed our stay. The Raffles Hotel is beautiful on the outside, with beautiful gardens and public rooms, large, well-furnished bedrooms, but with archaic plumbing and a complete absence of hot water in the showers. We also visited Japore, the capital of Malaya's southernmost province.

In Singapore and Hong Kong, the British trade freely with Communist China, and no great difficulty is apparently experienced in crossing the Communist China border by Chinese. The Bank of Communist China is a prominent edifice in both cities, and unquestionably does a huge business. Quite oddly, articles of evident Chinese origin cannot be legally transported from Hong Kong to the U.S. by tourists without a certificate of origin certifying that such articles were made in Hong Kong or were owned in Hong Kong before the Communists acquired control of China. From Singapore apparently no such restriction exists.

Manila Observations

We saw Manila thoroughly. We drove into the mountains of Luzon and saw how Filipino country people lived and earned their livelihood—largely through agriculture. Coconuts, papaya, rice and coffee are the principal cash crops. Water buffalo is the source of beef, milk and power. Agricultural methods were most primitive. Little had been accomplished in the way of farm mechanization, and acre yields for rice are very low. We visited the home of a wealthy Filipi-

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no owner of a plantation and rice mill. We were surprised to find his family highly educated, with one daughter and two sons citizens of North America; all Ph.D's. One daughter had married the son of the president of the Philippines.

In Manila a leading food and flour importer of the Philippines, Charles Shau and family, showed us every courtesy. Dinner in the Shau home was a delightful, unusual experience. Mr. Shau is recovering from a cerebral hemorrhage, but is in full possession of all faculties while partially confined to his bed. He actively runs the business, with the assistance of his sons, Emil Shau, age about 30, married, two children; and George Shau, unmarried, age about 21.

The Chinese custom is when a son marries for him to bring his bride to his father's home and establish his family home in the ancestral mansion. So it was here. You saw a most beautifully-kept home—a family household that was well disciplined—and a thoroughly Christian family. Those youngsters sat at the table; the youngest said Grace for the family; they were not permitted to eat all the courses served; and they were thoroughly taught that children are to be seen and not heard. This was marvelous behavior, unusual to behold.

Emil Shau took us to visit several Manila bakeries, the newly constructed flour mill, and Mr. Shau's well-kept flour warehouses, which we found a pleasing contrast to the bakeries visited. We concluded that the Philippines need far more greatly a modern pilot bakery plant to bring up to date prevalent Filipino baking premises, procedures, and sanitation, than the country needs the $7 million flour mill recently finished with American funds. There appeared to be little, if any, demand for bran and shorts; no wheat is produced, and mill warehouses were filled with mill feeds.

Friends Met

In Manila we met Dr. and Mrs. Bill McCormick. The doctor is a pre-med graduate of North Texas State College; his wife is the daughter of a doctor neighbor, deceased, who lived only a block and one-half nearer town on our street in Denton. I frequently carried her to school, finding her standing on the street corner, with her school books in her hand, as I drove to work. These young folks drove 60 miles after a hard day at the hospital for Dr. McCormick to dine with us, only to return the same night, over the same circuitous mountain roads, heavily populated by pedestrians, natives, goats, sheep, pigs, burros, occasional trucks, etc., for hospital duty at 7:30 next morning.

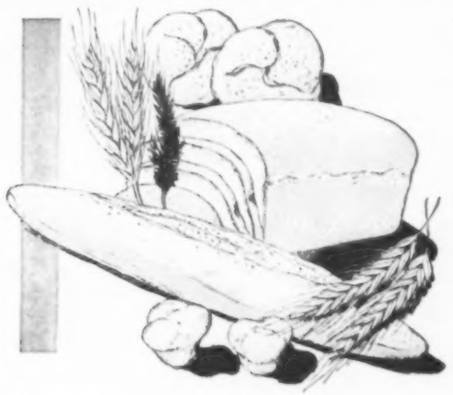
On arrival, after greeting Sharon, his wife, I said to Dr. McCormick, "Doctor, I have the strange impression that I somewhere have seen you." He said, "Mr. Morrison, I reckon you have. I worked nights in your elevator at Denton while going to college." The world is a small place!

Next stop—Honolulu. There we remained two days. This was our second visit. We stopped only because we needed rest. We thought nobody knew us there; yet a telephone call awaited us as we entered our hotel. Dr. Garland Threlkeld, and his young wife, Sally, former Denton residents, are teachers in the Kamehameha University and Secondary Schools. Dr. Threlkeld teaches aviation science. He had built his own plane and insisted that Mrs. Morrison and I must fly in his little four-place plane with them to see Oahu by air, after attending church with them Sunday morning. Surely that was a postman's holiday; the air was very rough; and only the morning before, we had ended an air flight of 39 hours' duration, with stops only for refueling.

Conclusions

We returned from the Orient with the same convictions which followed our trips to Europe in 1953 and 1955; namely, that many Americans hold the erroneous idea that America is far ahead of the rest of the world in all human progress. This simply is not true. The world is awakening and is moving ahead fast. In some fields we definitely do excel, but in fields of human endeavor which require utmost precision for a satisfactory finished product, I find that American quality is often inferior. I attribute such condition to the coddling of American labor by labor unions resulting from federal laws which encourage it. It seems to me that often the American workman has lost all pride of craftsmanship, and is interested most in the size of his paycheck, the shortness of his work hours, his leisure time, and provision for his security. I believe that "discontent" has accounted for most human progress, and "insecurity" has led Man to his greatest efforts and accomplishments. I fear that if America long continues its prevalent policy of seeking to provide welfare and security for the world, while yet reveling in luxury at home, our beloved U.S. may come to the end which marked the demise of Grecian, Roman and Napoleonic empires of former centuries. When a nation becomes fat, lazy and profligate, history proves it is ripe to fall.

FLOUR FOR MAN'S BREAD*

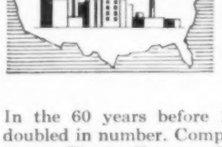


A Brief History of Milling and Baking by SCIENCE WRITER

CHAPTER XXIII *Millers Cultivate The Domestic Market*

Producing for the Mass Market

As long ago as 1870, progressive American millers sought better processes and wider markets. They demonstrated, many years before Henry Ford, that production for a mass market led to decreased costs, better quality, and increased quantity.



The automatic roller mill, which resulted from the revolution in milling, had the capacity for large production. The Haxall mill in Richmond and the Washburn A mill at Minneapolis could respectively grind 5,000 and 4,000 bushels of wheat daily.

In the 60 years before 1900 merchant mills more than doubled in number. Competition became a more important factor. The inefficient mills were eliminated leading to the decline in the number of grist mills. Economical operations, well-organized and on a large scale, were favored.

Selling to the Mass Market

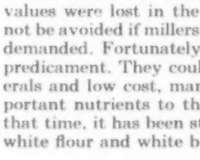
In the latter years of the 19th Century, millers established sales departments which concentrated on expanding the domestic market. Single brands were put on sale nationally. As an example, Washburn-Crosby marketed its "Gold Medal" flour, which replaced a variety of other brands it sold in different parts of the country.

Special packaging for home consumption was used. 24½ lb. and 6 lb. paper bags went into the market, thus beginning the convenience package which continues to this day. National magazine advertising was first used in 1893 with a one-inch advertisement in the Ladies' Home Journal. This type of sales promotion expanded enormously and did much to make some brands consumer favorites.

Serving the Whole Nation

The economic facts of life for millers in the first half of our century led them to set up flour, feed, and breakfast food plants in strategic parts of the nation, so that they could give better service to their customers and be better placed in relation to their sources of supply and their markets.

Keeping It White and Making It Better



Open a package of today's family white flour. Look at it carefully. Rub a pinch between your fingers. You'll find it smooth and fine, with a rich, creamy-white color. That whiteness is important. Practically all Americans demand it in their flour and bread.

About twenty years ago, research into the nutritive values of white flour showed that important vitamin and mineral values were lost in the milling process. These losses could not be avoided if millers supplied the product that consumers demanded. Fortunately, there was help for millers in their predicament. They could *enrich* their white flour with minerals and low cost, man-made vitamins, thus restoring important nutrients to their product. Enrich they did. Since that time, it has been standard practice to enrich all family white flour and white bread and rolls.

Where Do the Vitamins Come From?

A vitamin is a vitamin whether it is extracted from a natural source or made by man. It has but one chemical identity. The vitamins used in enrichment are manufactured—at more economical costs than if they were extracted. They are produced by internationally-known and respected organizations, among which is the famous firm of Hoffmann-La Roche, a pioneer in vitamin research and quantity production.

You may be interested in having reprints of these articles for reference or educational purposes. This and all other chapters are available without charge. Write to the Vitamin Division, Hoffmann-La Roche Inc., Nutley 10, New Jersey. In Canada: Hoffmann-La Roche Ltd., 1956 Bourdon Street, St. Laurent, Montreal 9, P. Q.

The next chapter titled: "Today's Flour" will be published soon.

*Based on the book with the same title by John Storck and Walter Dorwin Teague, this series has been made possible through the cooperation of the copyright holder, the University of Minnesota.

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No. 2094—Grain Shoe

Research Products Co. recently added a new item to its list of supplies. The item is a specially designed grain shoe that is used by elevator men in inspecting and treating grain.

Such shoes are especially useful, the firm said, when working in large flat storage areas. For more information check No. 2094 on the coupon and mail it to this publication.

No. 2095—Belt Conveyors

The availability of a revised technical bulletin on slider-board belt conveyors has been announced by Sprout, Waldron & Co., Inc. The bulletin provides construction, installation and operational details. Close-up photographs show the drive mechanism and the ease of accessibility for inspection and cleaning. Also included is an engineering drawing with complete specifications and capacity ratings. Copies are available by checking No. 2095 on the coupon and mailing it to this publication.

No. 2096—Modernized Handling

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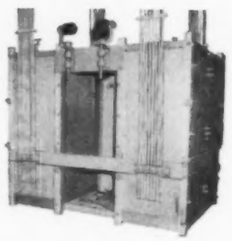

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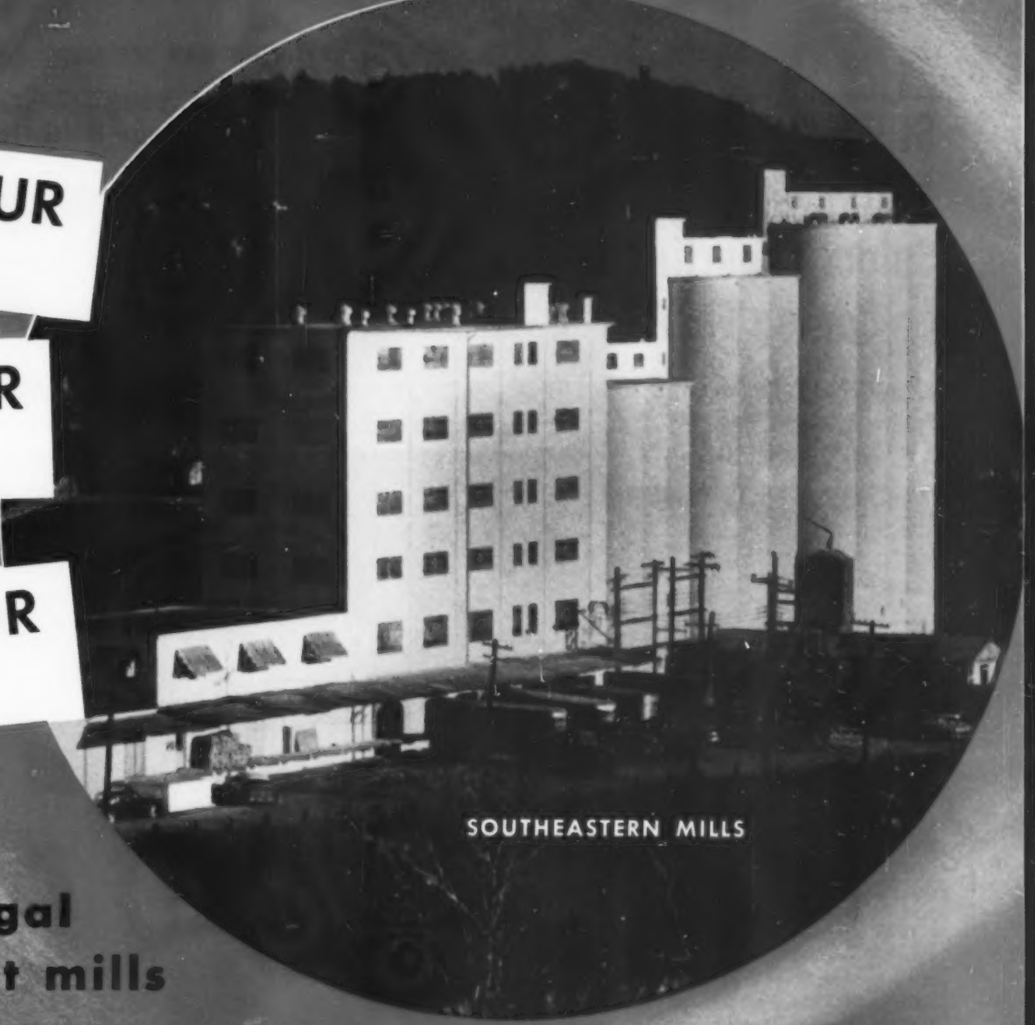
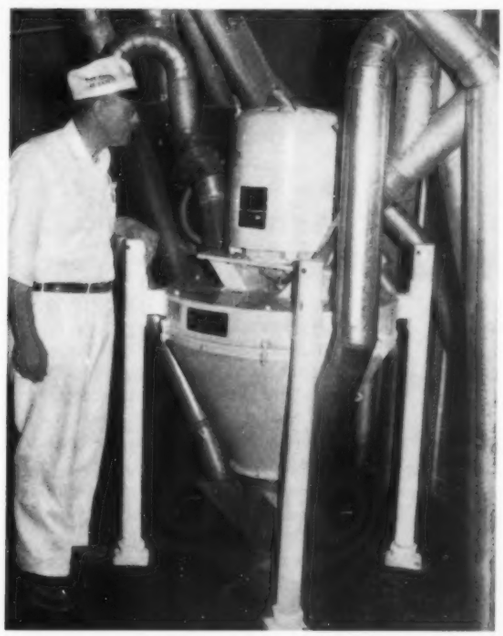
with centrifugal impact mills





A 27" Entoleter Centrifugal Impact Mill (pictured above with Fred Stivers) was installed at Southeastern Mills. Its 15 horsepower motor has a put-through capacity of 3500 lbs. per hour. This compact machine requires only 14.8 sq. ft. of floor space.

The bottle-neck to increasing mill capacity is usually roller mill surface... but it's a fact that the replacement of roller mills with Entoleter® Impact Mills at certain positions will free roller mill surface and increase capacity as much as 20%.

This radically new concept in grain milling utilizes a relatively low cost machine, which takes up a minimum of floor space and requires surprisingly low horsepower.

SOUTHEASTERN MILLS AT ROME, GEORGIA PROVES IT

Fred Stivers, Superintendent of Southeastern Mills reports, "Our primary goal was to increase capacity at a minimum investment with no increase in production cost and practically no floor space to spare." By replacing our second mid roller mill with an Entoleter mill, we increased our capacity from 120 to 140 bushels per hour, running hard wheat with no loss of quality nor change in yield per bushels.

Write Now! We will be glad to send literature or arrange a visit to discuss this important new concept in grain milling.

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Sturtevant Air Separators Select Superfine or Coarse Flour

40 to 400 Mesh Selection Range Provides Versatility Impossible with Conventional Sifters

In 40 years of use in a variety of industries, more than 2000 Sturtevant Air Separators have classified particles finer than sifters can economically do. Further, with Sturtevants, either a superfine or a coarse product can be selected. Low power and maintenance, plus small plant space mean additional efficiency for milling systems.

The precise selection of Sturtevant Air Separators is based on the exact control of air currents and centrifugal force. Simple adjustments create counter-action between the two that allows selection of almost any desired particle size — in either upper or lower ranges.

Pioneers in air separation, Sturtevant engineers may be able to help you upgrade your milling system while lowering production costs. Write today, describing your requirements.

Send for Air Separator Bulletin No. 087.

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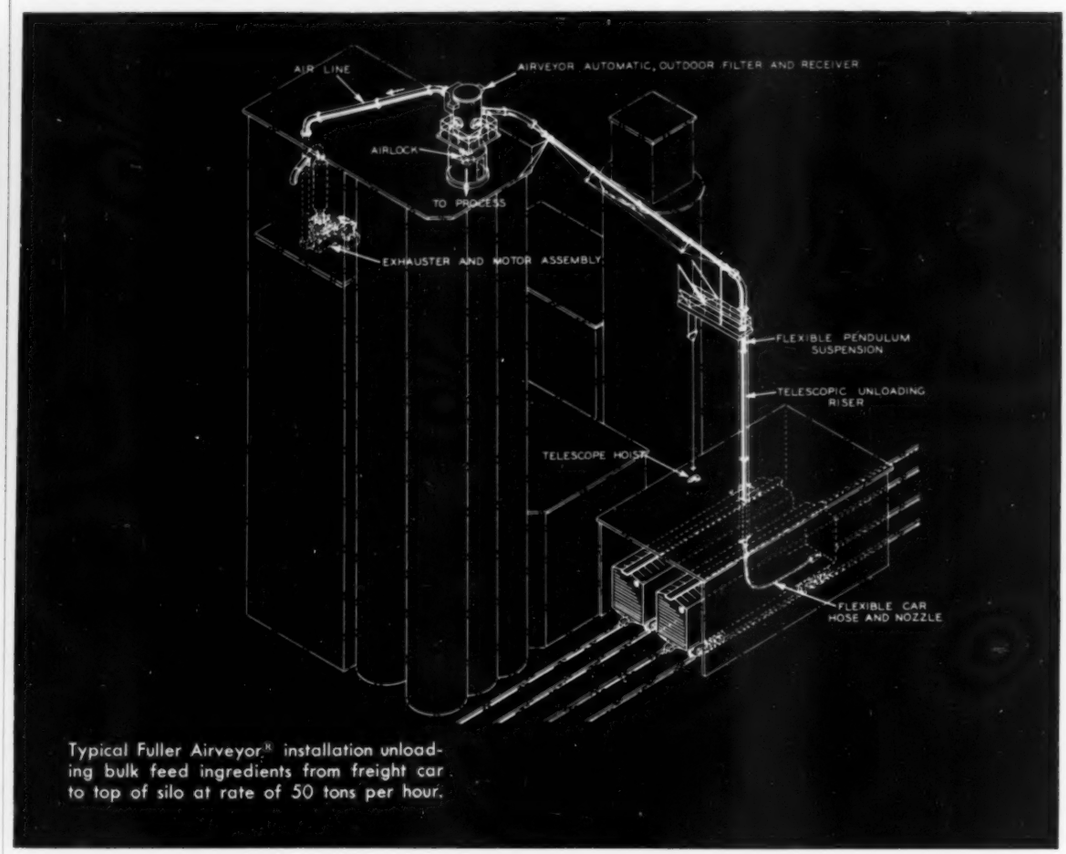
Minneapolis, Minn.

and provided for plant expansion by installing a pneumatic conveying system is described in a new four-page, illustrated bulletin offered by the Fuller Co. Written by Calvin M. Ochs, area maintenance supervisor for Union Starch, the bulletin describes the former handling system and compares it with the new pneumatic system. The bulletin is illustrated with seven in-plant photographs and a schematic drawing which graphically compare the old and new materials handling routes. Check No. 2096 on the coupon.

No. 2099—Grain Storage Building

A new rigid frame grain storage building has been announced by Stran-Steel Corp., a division of National Steel Corp. The building, called the Grain-Master "100," is 100 ft. wide and 53 ft. high at the roof peak. It is designed for large capacity storage. Special features designed into the new building include a new three-section bulkhead door, new access ladder and platform, new heavy-duty air tunnel, colored steel panels, and provisions for faster loading. Rigid frame construction leaves the interior free of truss-work, columns, and long tie-rods spanning from wall-to-wall. For more information check No. 2099 on the coupon.



Typical Fuller Airveyor® installation unloading bulk feed ingredients from freight car to top of silo at rate of 50 tons per hour.

How Fuller Pneumatic Bulk Materials Handling Can Help You Expand Plant Capacity

When plants processing dry, finely-divided bulk materials greatly expand production and bulk storage facilities, Fuller pneumatic equipment is most likely to take on the expanded materials handling job.

For example, a major Midwest feed company had been using a mechanical system to unload freight cars of barley, wheat, shorts, bran, dehydrated alfalfa and other feed ingredients. But, when the plant recently increased its number of storage bins from 10 to 40 and stepped-up deliveries of these ingredients a faster, more efficient unloading system was needed. The answer was a Fuller Airveyor® vacuum system—operated by one man at a pushbutton control. This system conveys as much as 50 tons of bulk feed ingredients an hour. The Airveyor® pneumatic lines were installed easily. Sanitary sealed-in system seldom needs maintenance and is inherently self-cleaning.

Consider the low initial cost and many operating economies of Fuller pneumatic conveying systems when you plan to increase plant capacity. Write or phone outlining your problem. Fuller will gladly furnish additional information with appropriate recommendation. 1175 A-268

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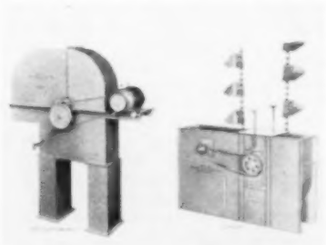
No. 2097—Steel Elevators

To meet the growing demand for dust-tight, fire-resistant elevator equipment, the Munson Mill Machinery Co. has announced a line of steel heads, boots and leggings. In addition to the safety factor provided by the steel construction, this equipment is engineered in accordance with individual elevator needs. The top half of the head is built in two sections, which may be removed without disturbing the head bearings or motor. Cleanout and maintenance operations on Munson boots are accomplished through two removable panel-type doors, located on opposite sides of the boot. For more information check No. 2097 on the coupon.



No. 2098—Car Shaker

A new data sheet, presenting the latest revisions on Syntron's recently introduced unbalanced-motor vibrating car shaker, is announced by the Syntron Co. The car shaker is designed to accomplish the rapid emptying of railroad hopper cars without damaging the cars. It finds application in any industrial operation involving the volume handling of bulk materials received by rail, from marine shipping docks to food processing plants, the firm said. Check No. 2098 on the coupon to obtain a copy.

No. 2100 Plastic Bag Seal

A flush, weld-type seal has been developed by Chippewa Plastics, Inc., for its new heavy duty, polyethylene bag which brings the strength of critical sealing areas up to virtually the strength of the transparent polyethylene film itself. Pioneered by Chippewa, the heavy gauge bag was introduced commercially in 1958 and has been successfully used to ship such products as chemicals, fertilizers, hybrid seed corn and powdered milk. It is expected to have wide use in bagging a variety of items that require a positive moisture barrier, including detergents, vitamins, aspirin, boric acid, peat moss, flour, sugar and many chemicals. For more information check No. 2100 on the coupon.

——BREAD IS THE STAFF OF LIFE——

MILL GARAGE BURNS

LEXINGTON, KY.—A garage of the Lexington Roller Mills, Inc., was destroyed by fire recently.

SIFTERS

(Continued from page 1a)

moving on the sieve may never be so thin that undesirably fine branny particles rub on the meshes (particularly important in the case of break and tailing passages).

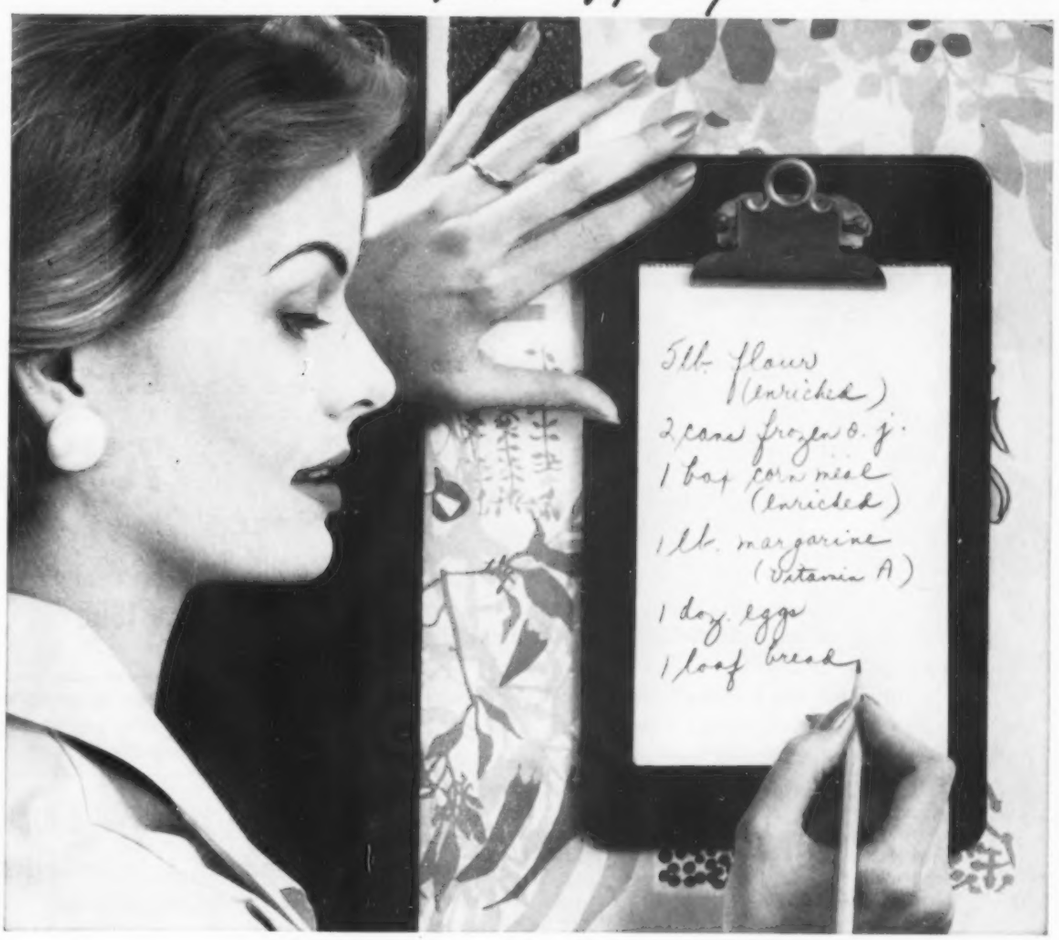
The throughput for pure sieving work, for example, for flour rebolt, is best with a medium sifting height. The sorting of semolinas and middlings has to be chosen as short as possible, particularly when grinding hard wheat, in order to avoid any internal rubbing of the products with each other when the sifting depth is great, as well as when it is low.

In order to be able to build sifters economically and to comply with the necessary requirements of all sizes of mills, new methods have now been found.

Figure 1 shows a new sifter floor. Inlet and outlet pipes are the same as hitherto were usual. A self-supporting box casing of steel accommodates the counter-weights and their bearings in the middle, and can be inspected when the cover has been removed. On one side of the drive, three sieve sets may be arranged, and on the other side four. Suitable doors are provided for each sieve set. These doors are supported above and below on double hinges and each can be opened readily with a few turns on four special locks. Naturally, sifters with two to eight sets of sieves and with sieves of different sizes can be united to form one sifter Special features are: perfectly smooth surfaces, streamlined design. The height of the sifter casing varies with the number of sieves of each compartment.

Figure 2 is a section through a sifting compartment (inlet—distri-

A Peek at today's shopping list shows...



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A new addition to the Bi-Cap line is Bi-Cap Bolted Cornmeal Enrichment. Pfizer also continues to offer its Bi-Cap Degerminated Cornmeal Enrichment plus both single and double strength flour enrichment mixtures.

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butor—flow of the product on two sieves, etc.). The flow channels are built in at the front ends. Advantages: The stock can be distributed over 1, 2 or 3 sieves and be fed again as found most suitable to 3, 2 or 1 sieve. The necessity to adapt the sifting depth of each particular stock can be accomplished to a great extent.

The stock rides over the sieves like a belt, without any obstructions by narrow spots, the stock does not drop directly from one sieve onto the cover of the next sieve, but onto a solid preliminary tray.

The throughs from the sieves move away laterally at both sides of the sieve trays. Through these arrangements the uniform flow of the stock is ensured and banking (choking) is avoided.

Figure 3: A section through the same sifting compartment shows that the middle part, the sieve set itself, has remained unchanged, while the flow channels have been moved to the side. The flow channels are built into the doors at both ends of the sieves. When the doors are opened, which can be effected on both long sides of the sifter, the sieve sets are freely exposed and each single sieve or sieve tray can be drawn out independent from each other.

The flow channels serve at the same time as stiffenings for the doors, and because of the automatically-adjusted pressed-on felt-lining no escape of dust is possible. The tightness of the sieves and of the sieve trays is further ensured by special shaped profiles, in which these parts are held and at the same time serve as nails when drawn out.

Changing sieves requires only a few minutes. Even a change in the flow scheme can be carried out without undue difficulty in case of need. The significance of these advantages lies in the proper utilization of each sieve, i.e. each sieve can be used at its optimum capacity and correspondingly combining of the sieves in one set according to a pattern most advantageously to each particular grinding passage.

Starting up a new mill, all flow schemes are fixed on the basis of past experience. Slight adjustments, which cannot be avoided in order to suit certain requirements arising through differences in the kind of wheat, may be at once made by changing the sieve cloths, i.e. by changing certain sieves. That means that the whole sifter cloth surface is loaded to its maximum, and therefore increased capacity and better performance made possible.

Figure 4 illustrates a set of sieves with the door open and a sieve and a collecting tray half drawn out. The flow-through channels with openings built into the doors, the flow scheme carriers, can clearly be seen. These flow-through channels extend over the entire width of the sieve. All openings are surrounded by sealing felt. Since the felt is adjustable at the sieves and is pressed onto them

DAY has received many favorable reports from Pneu-Spout users. These reports tell about the speed, ease and low cost of installing Pneu-Spout. Here are a few of the many reasons why so many mills installed Pneu-Spout during the past twelve months.

- **SAVES TIME**—Pneu-Spout is supplied ready to assemble. It goes up four times faster than regular mill spouting. Unskilled labor can install and a hacksaw, file and screwdriver are the only tools needed for installation.
- **SAVES MONEY**—Pneu-Spout is re-usable. This makes it easy to change flows because it can be dismantled and re-erected quickly. It's also ideal for temporary spouting.
- **NO LININGS—NO DEAD SPOTS**—Pneu-Spout requires no linings. It is run directly through floors thus eliminating one of the main causes of chokes in mills that are wood spouted. Pneu-Spout is sanitary, non-corroding. Lightweight but strong, Pneu-Spout is made of aluminum; there are no non-metallic parts to rot or deteriorate.

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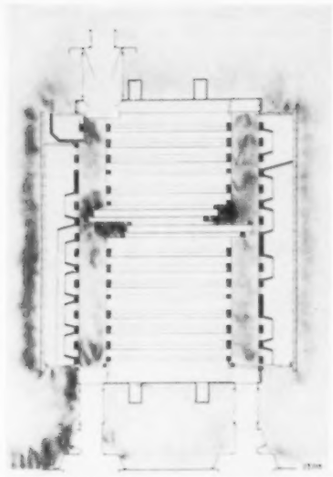

Figure 3

and onto the sieve trays by the door, positive tightness is guaranteed and this has been confirmed even under severe working conditions.

This sifter is actually a "tray sifter." In contrast to a so-called drawer system in which the sieve is inserted into a removable drawer and the tray of the sieve drawers itself represents the sieve collecting tray. In our case when the door is opened any desired sieve or any desired tray can at once be drawn out, like the shelves in a filing cabinet.

A further advantage of this sifter consists in the possibility of using various methods of sieve cleaning. Figure 5 shows two sieve frames in front of the open sifting compartment. In the first sieve frame the cleaning is effected by circulating brushes as usually is done in Europe. In the second sieve frame the cloth is cleaned by cotton cleaner. Instead of these cleaners, balls may also be used.

Why is more than one sieve cleaning provided, and what is the difference? Experience has shown that the sieve surface of short sieves can be utilized more favorably when the conventional conveying blades over the sieves are omitted. These conveying blades disturb the sifting effect to some extent and convey the stock over the sieves without the desired particles of this stock coming into contact with the sieve clothing. The short sieves work with a certain banking. Experiments and practical experience have determined the length of the sieves.

Development of the cleaning of the sieves proceeded along with this practical knowledge. Brush cleaning requires the side underneath the cover to be flat, i.e. without any higher part whatever, since the bristles of the brushes may not be hindered when circulating. It is therefore necessary to arrange the stiffening of the sieves, which is absolutely necessary, on the

Figure 5

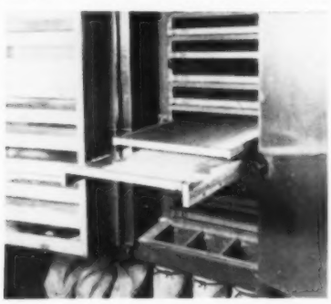

Figure 4

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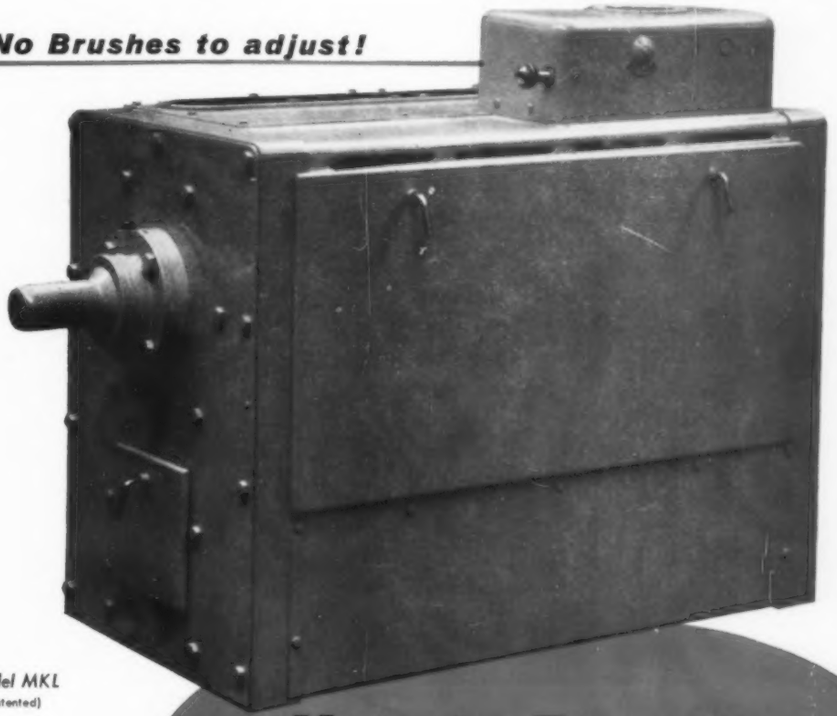

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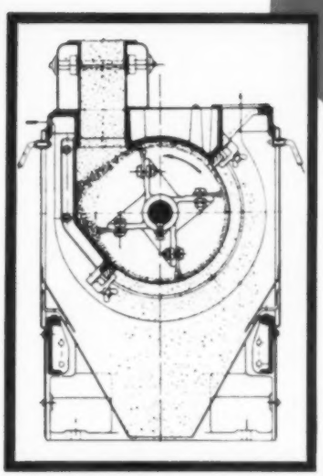
(Patented)

How to Remove all the Flour From Your Bran



- Cleans thoroughly, uniformly without reducing bran.
- More flour.
- Compact, high-speed—can be installed in little floor space or suspended from ceiling . . . on the break side or on the reduction side.
- Practically no maintenance and attendance required.
- All-metal construction.
- Little wear . . . not enough to reduce performance.
- Low power requirements.

With the BUHLER Impact Finisher, you can remove the last traces of flour from bran without cutting or splitting it, thus obtaining a bran with a minimum starch content.

Special centrifugal process. A high-speed rotor moves the stock through the machine with a spiral action. To prevent stock from acquiring the same speed as the rotor, which would almost eliminate the impact action, it is continually thrown against a baffle plate. The loosened flour particles pass through a steel screen.

Easy adjustment. A unique inlet regulation controls the length of time the product is exposed to impact action by shortening or lengthening the effective path of the bran through the machine. Changes can be made quickly while machine is running.

Quality product. Bran is large and clean after leaving the machine and the flours are very fine and light in color. Since there is no actual rubbing action, power requirements are low.

Impact Finisher MKL also gives excellent results in rye mills.

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upper side of the cover as is generally the case. But these stiffenings mean impediments in the short sieve without conveying blades. The flow of the stock is hindered and the sieve takes much longer to empty. This is one reason why brushes have been replaced by cotton cleaner.

Another reason is the kind of sieve cleaning itself. The circulating brushes do not clean the corners of the sieve. With the reduced sieve surface, the loss of cloth surface resulting from these corners is a great drawback. The case is quite different when cleaning with cotton cleaners. Here the sieve is divided into several fields. At the same time these divisions stiffen the sieve frame. The cotton cleaners move on a wire grating so that they set the cloth above them into vibration by knocking, and at the same time create a sweeping action underneath the cloth. In this way the sifting capacity, and in particular the throughput of the sieve, is much higher because not only is the whole sieve surface thoroughly cleaned, but also the cleaning intensity is considerably increased.

It is impossible to draw any clear line showing where sieve cleaning with cotton cleaner is better than cleaning with brushes. But for the performance of the sifter in the mill, cleaning by cotton cleaners is on the average a great advantage.

Summary of the advantages:

- Maximum throughput per square foot of sifting surface, with minimum space requirements.
- Independent changing of the sieves and collecting trays at each point of the sieve stack.
- Handy, standardized sieve dimensions—therefore easy and quick to handle.
- Sieve cleaning with cotton cleaners or with brushes.
- Positively dust-tight to the outside as well as to the inside.
- Easy and practical to attend for each sifting compartment.
- Greatest flexibility of choosing the most suitable sifting scheme.

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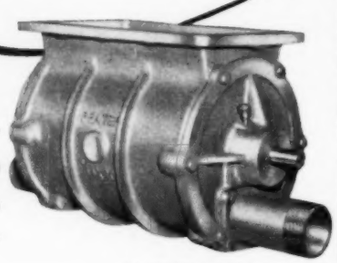

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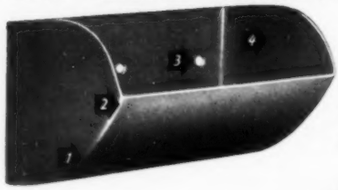

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(4) Hyperbolic sideboard ends permit greater load capacity without "slopping."

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"give us accurate, continuous blending over a wide feed range"

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Merchen Scale Feeders, with feed rates from 3 to 3000 pounds per minute, require no adjustment for changes in material density. They are suited for most industrial continuous blending or automatic batching processes. For more information about Merchen Scale Feeders, write for Bulletin M-36. 57.

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